

## CHAPTER 2.

### MATERIALS, TOOLS, AND EQUIPMENT

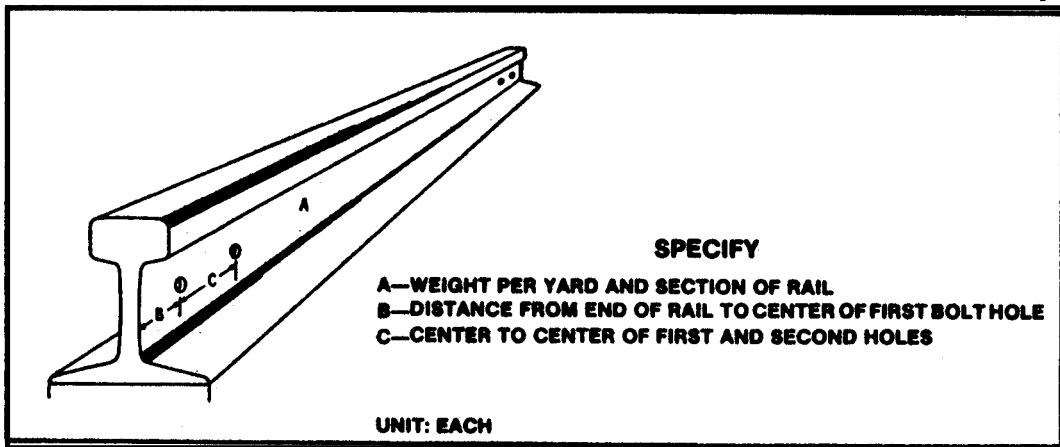
#### Section 1. MATERIALS

##### 2-1. General

Maintenance and repair of railroad trackage require the use of special materials, tools, and equipment. It is important that personnel responsible for this maintenance be completely familiar with identification and nomenclature for purposes of use and requisitioning.

##### 2-2. Material Nomenclature and Specifications

In requisitioning track materials, it is important that proper details be given to obtain the exact material required. Figures 2-1 through 2-14 illustrate the most common track materials and present specification details required for drawing clear requisitions.



*Figure 2-1. Rail details.*

##### 2-3. Stocks of Material

Recommended stock quantities for emergency and replacement use are outlined below.

2-3.1. Where deemed appropriate, it is recommended that the following quantities of material be stocked at a convenient location along running tracks or industrial trackage.

2-3.1.1. Two full-length rails of representative weight and section (Figure 2-1).

2-3.1.2. Two short-length rails of representative weight and section.

2-3.1.3. Two pairs of joint bars and compromise joint bars (when appropriate) with bolts and lock washers (Figures 2-2 and 2-3).

2-3.2. Classification/Receiving Yard or Industrial Area. At classification and receiving yard, or other congested areas, stocks should include:

2-3.2.1 One frog of representative number, weight,

and section (Figure 2-4 and Table D-1).

2-3.2.2. One set of switch points (right and left hand) (Figure 2-5 and Table D-1). **NOTE:** Must match existing points in type, section, length, and drilling pattern.

2-3.2.3. Two guardrails (Figure 2-6). Tee rail or one piece manganese. **NOTE:** Guardrails may be straight on ends.

2-3.2.4. One full-length rail.

2-3.3. Central Storage. Recommended stock quantities at a designated central storage area are two full-length rails with track fastenings such as joint bars, bolts, spikes, rail anchors, and tie plates (Figures 2-7 through 2-11) for each mile of track.

2-3.4. Emergency. Minimum standby stocks for emergency use at central storage area are:

2-3.4.1. Switch stand repair parts (complete) (Figure 2-12).

2-3.4.2. Two sets of switch ties (Figure 2-13).

2-3.4.3. One care (30 to 50 tons) of ballast. **NOTE:** This may be deleted at small installations with short trackage.

## 2-4. Storage of Material.

Stocks of material in the warehouse, section tool house, or in open storage will be properly stored (Figures 2-14 through 2-16).

2-4.1. Rails and Track Accessories. Rails stored at points along a railroad for future use should be segregated by weight and section and stacked in neat piles (Figure 2-14). Store rails above probable high water in case of flooding, and at least 10 feet from the nearest track. Protect accessories from the effects of inclement weather. Always store materials so that they will not interfere with the movement of train

crews or personnel frequenting the area.

2-4.2. Wood and Concrete Ties. Segregate timber cross-ties according to size and type, and store by stacking on high, dry ground. Treated ties may be stacked edge to edge (Figure 2-15). Avoid handling ties with sharp instruments other than tie tongs. Keep ground in the storage area bare of debris or vegetation for at least 2 feet around every stack of ties and clear of vegetation over 6 inches high within 10 feet of any stack; slope the ground so that water will not remain under the stacks or in their immediate vicinity. It is especially important that all decaying wood debris be removed and that fire prevention measures be observed around the storage area. Figure 2-16 shows the proper method of storing concrete ties.

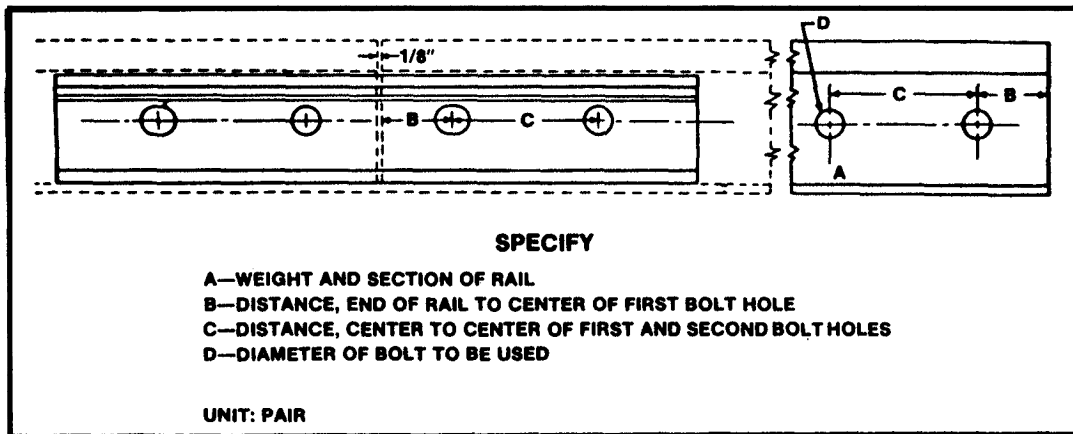


Figure 2-2. Joint bar details.

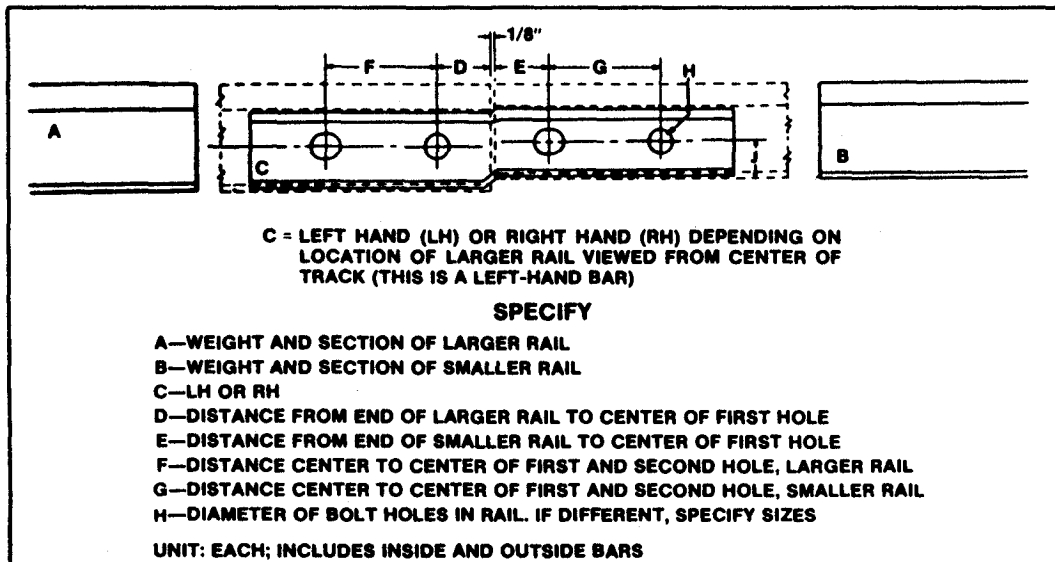


Figure 2-3. Compromise joint details.

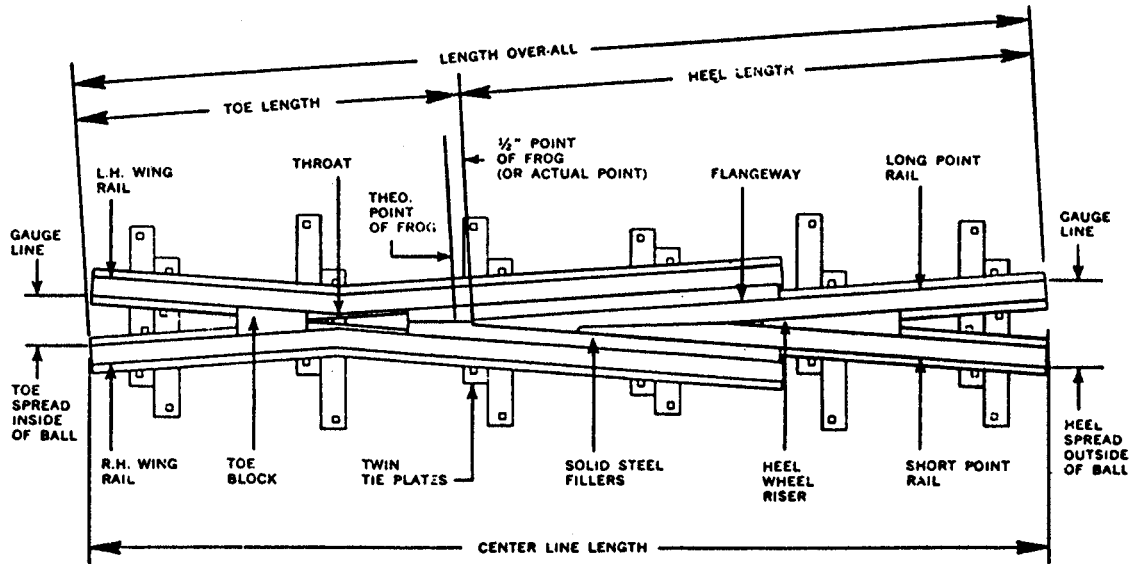


Figure 2-4. Frog details.

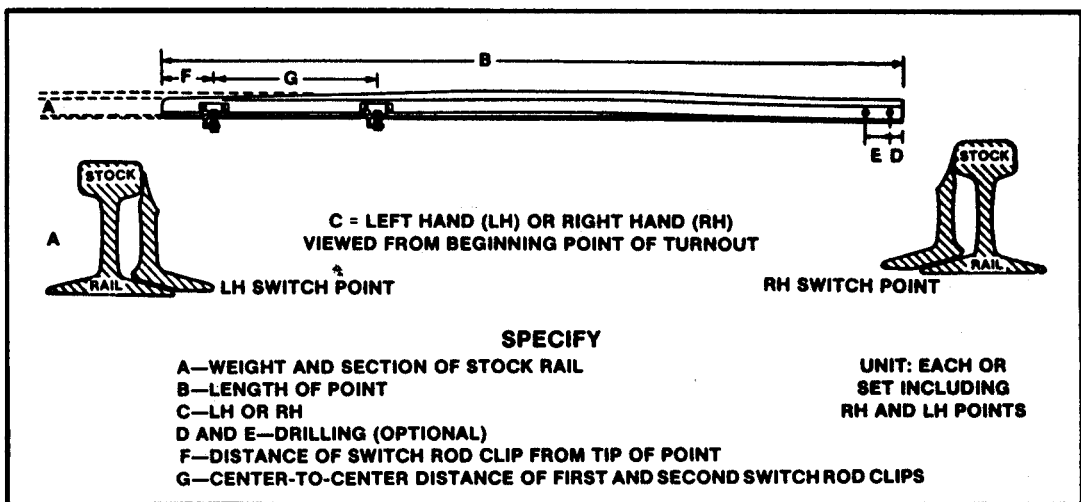


Figure 2-5. Switch point details.

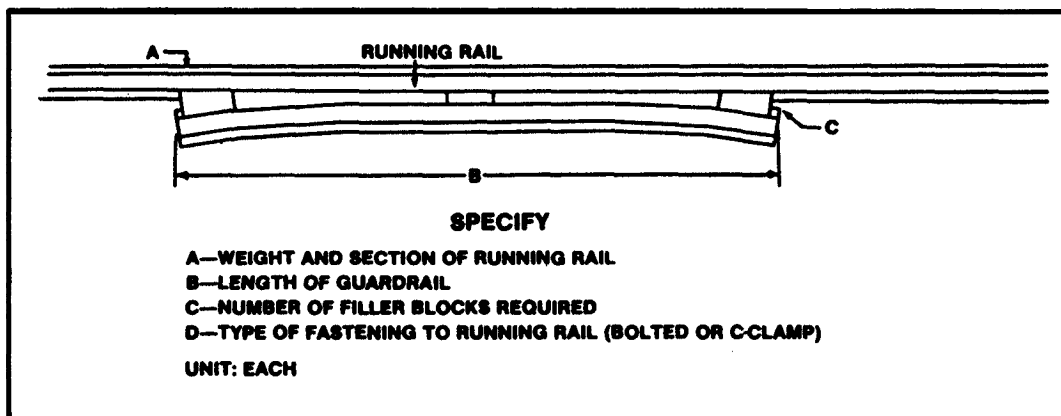


Figure 2-6. Guardrail details

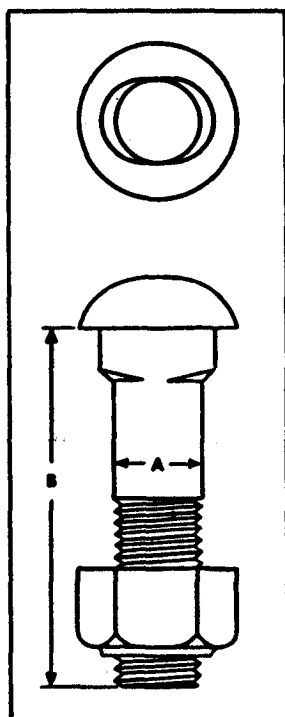


Figure 2-7. Track bolt details.

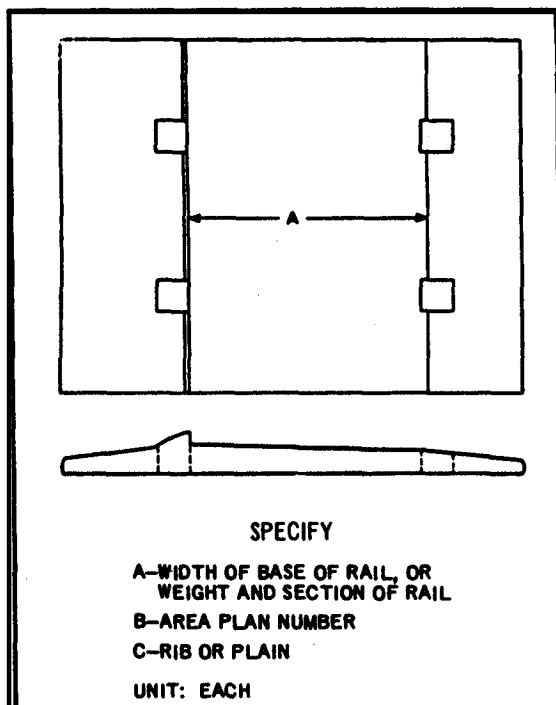


Figure 2-8. Tie plate details.

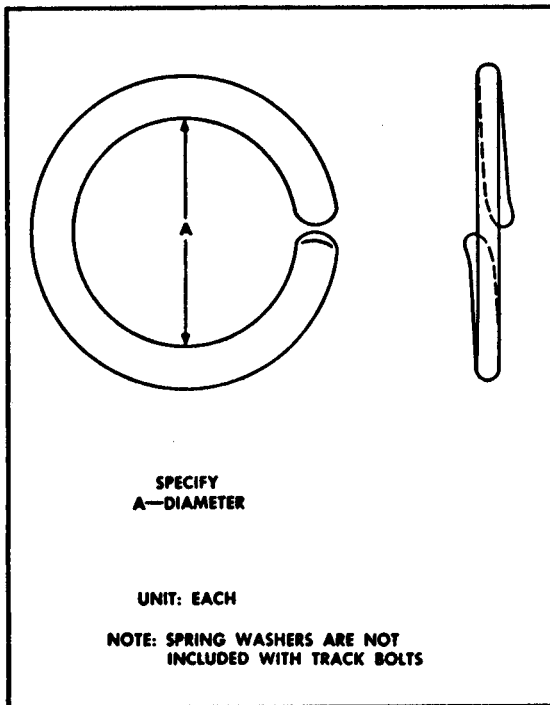


Figure 2-9. Spring lock washer details.

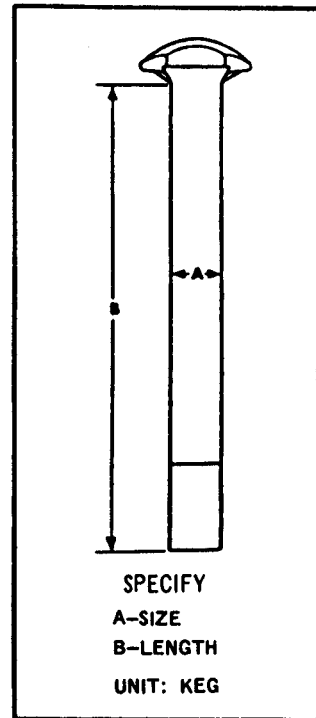


Figure 2-10. Track spike details.

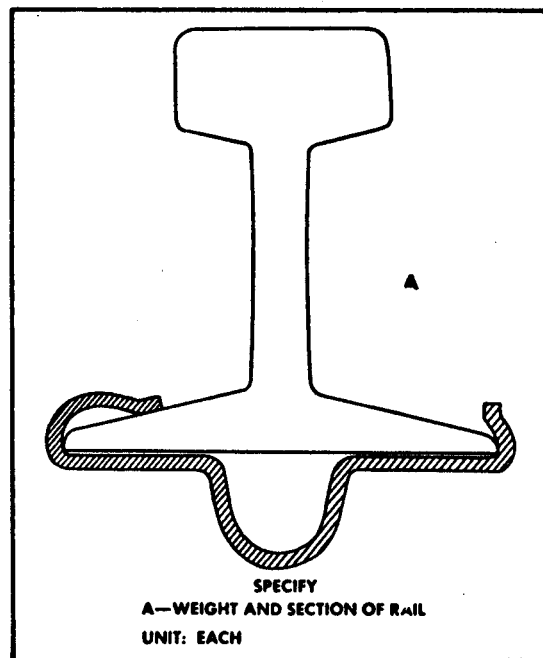


Figure 2-11. Typical rail anchor.

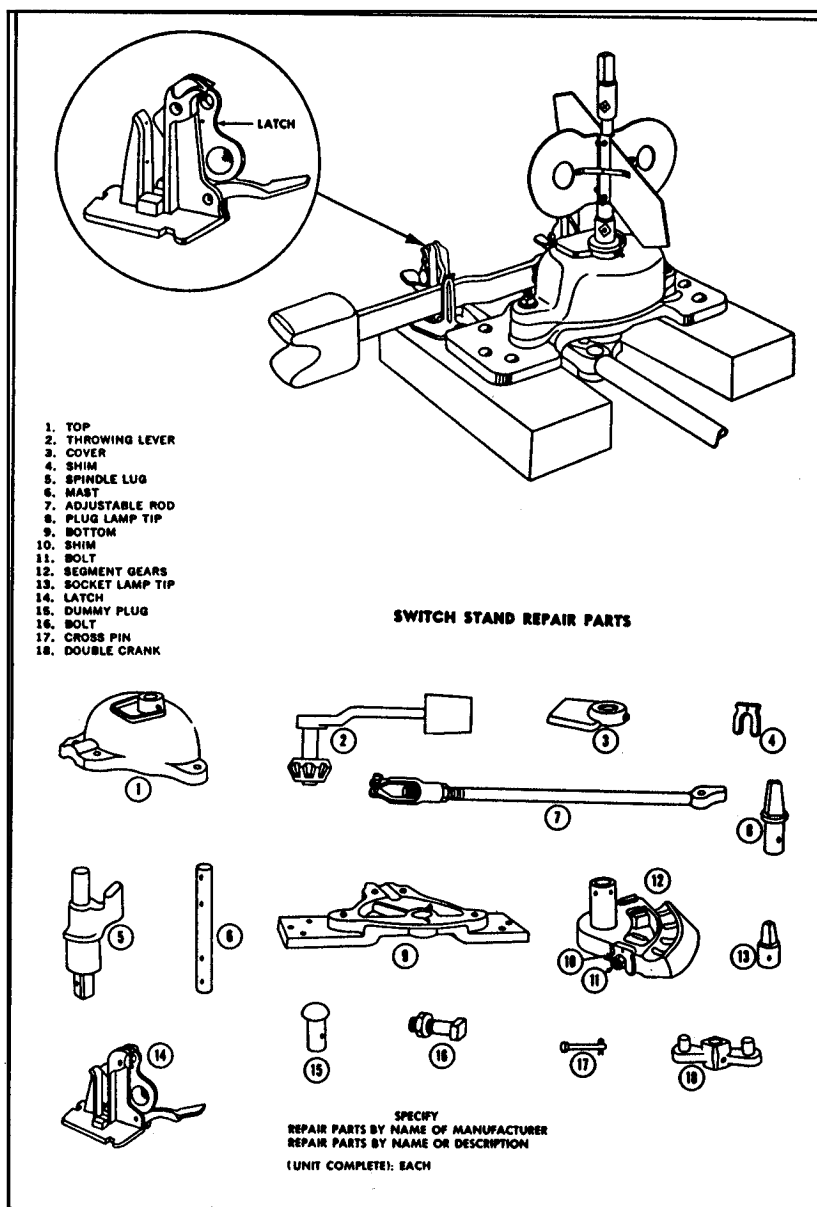


Figure 2-12. Details of switch-stand repair parts. Figure illustrates low stand with parallel throw.

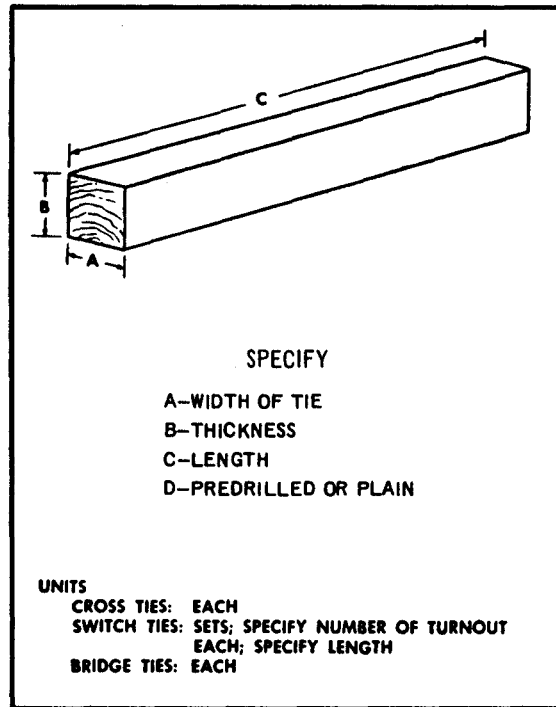


Figure 2-13. Switch, cross, and bridge tie details.

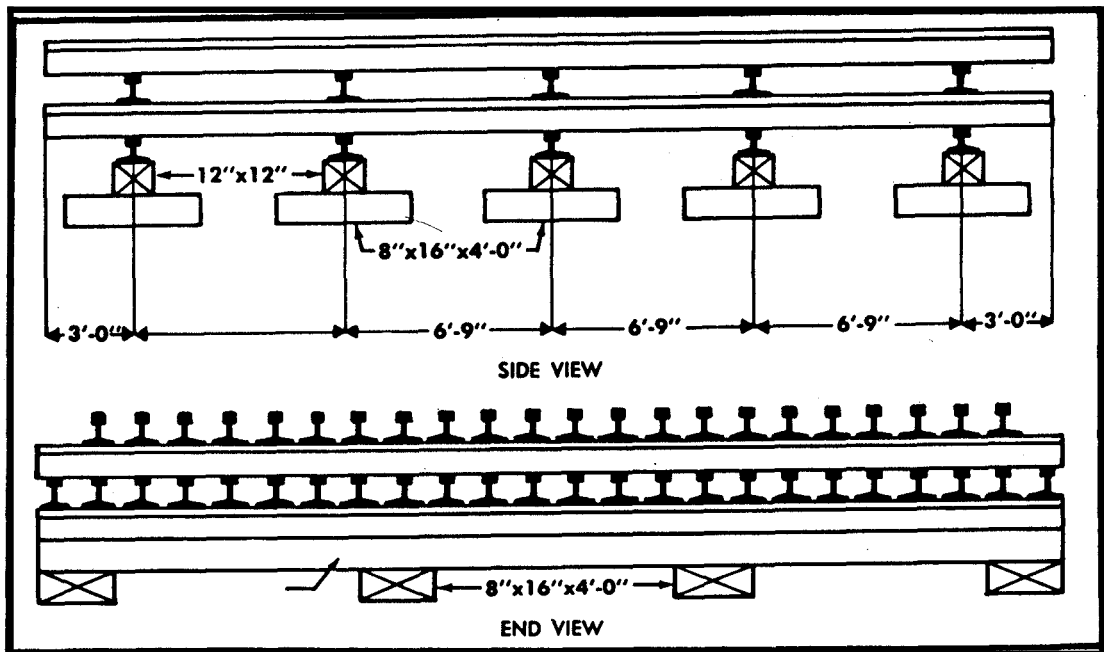
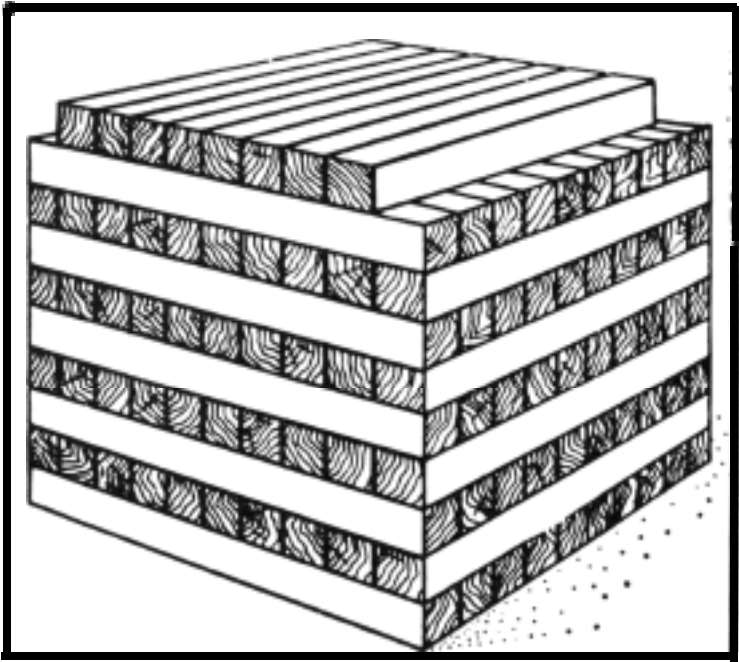
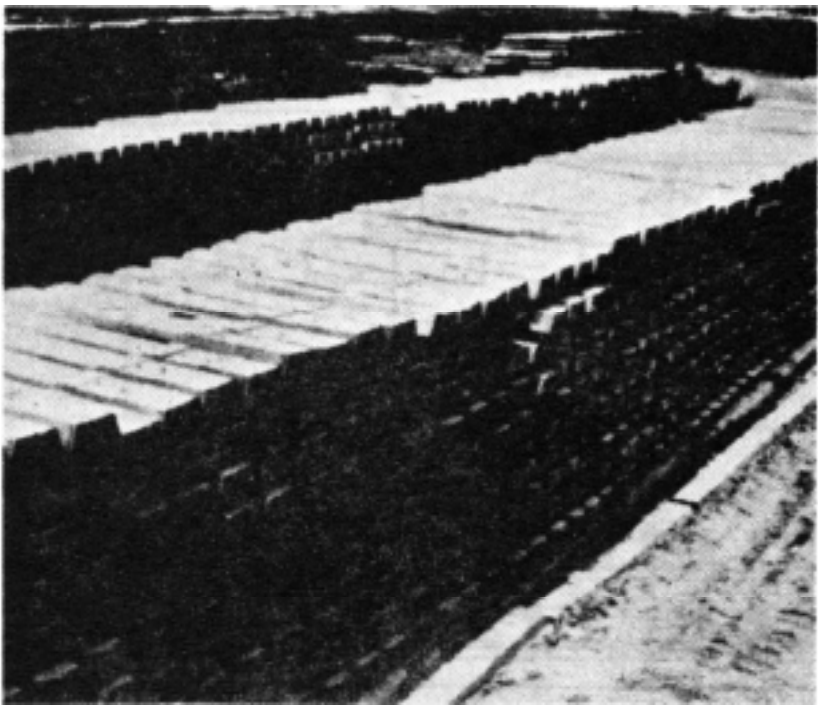


Figure 2-14. Proper method of stacking rails.



*Figure 2-15. Proper method of stacking wood ties.*



*Figure 2-16. Proper method of storing concrete ties.*

## Section 2. TOOLS AND EQUIPMENT

### 2-5. Requirements.

Tools and equipment should be provided in quantities consistent with the maintenance to be performed. In specific instances where additional or special tools and equipment are required, they should be procured through normal supply channels. Tools usually employed in track work are shown in Figure 2-17.

### 2-6. Care and Maintenance.

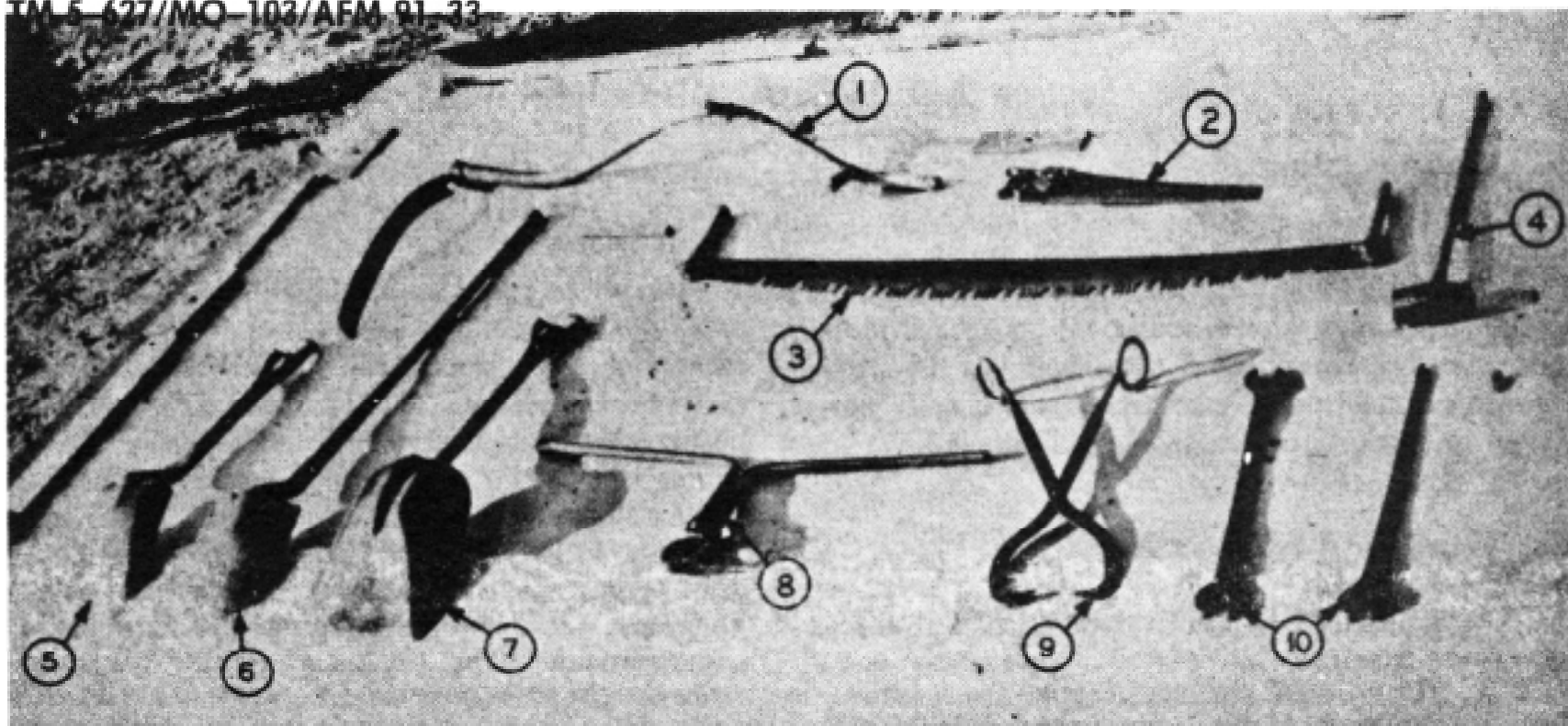
2-6.1. General. Tools and equipment shall be maintained in a constant state of good repair. They shall be kept free of rust and serviceable at all times. Cutting tools such as chipping hammers, drills, chisels, and saws must be kept sharpened and ready for use. Defective or wornout tools and equipment should be repaired or replaced. Personnel handling, using, and storing tools and equipment must do so in an orderly workmanlike manner, adhering to all safety precautions. Railroad maintenance personnel should be constantly aware of rail traffic dangers to life and limb, not only from their own standpoint but from the standpoint of the transportation of personnel and passengers. Tools and equipment must be kept clear of the right-of-way except during actual in-hand use. When loaded on trucks, track cars, or trailers, tools

must be placed so that they will not fall off when bumped or moved (Figure 2-18).

2-6.2. Power Operated Equipment. Where railroad maintenance equipment includes power-operated machinery or specialized machinery such as snow plows, mechanical spreaders, and the like, maintenance shall be carried out as described in individual equipment manuals or in the manufacturer's instructions.

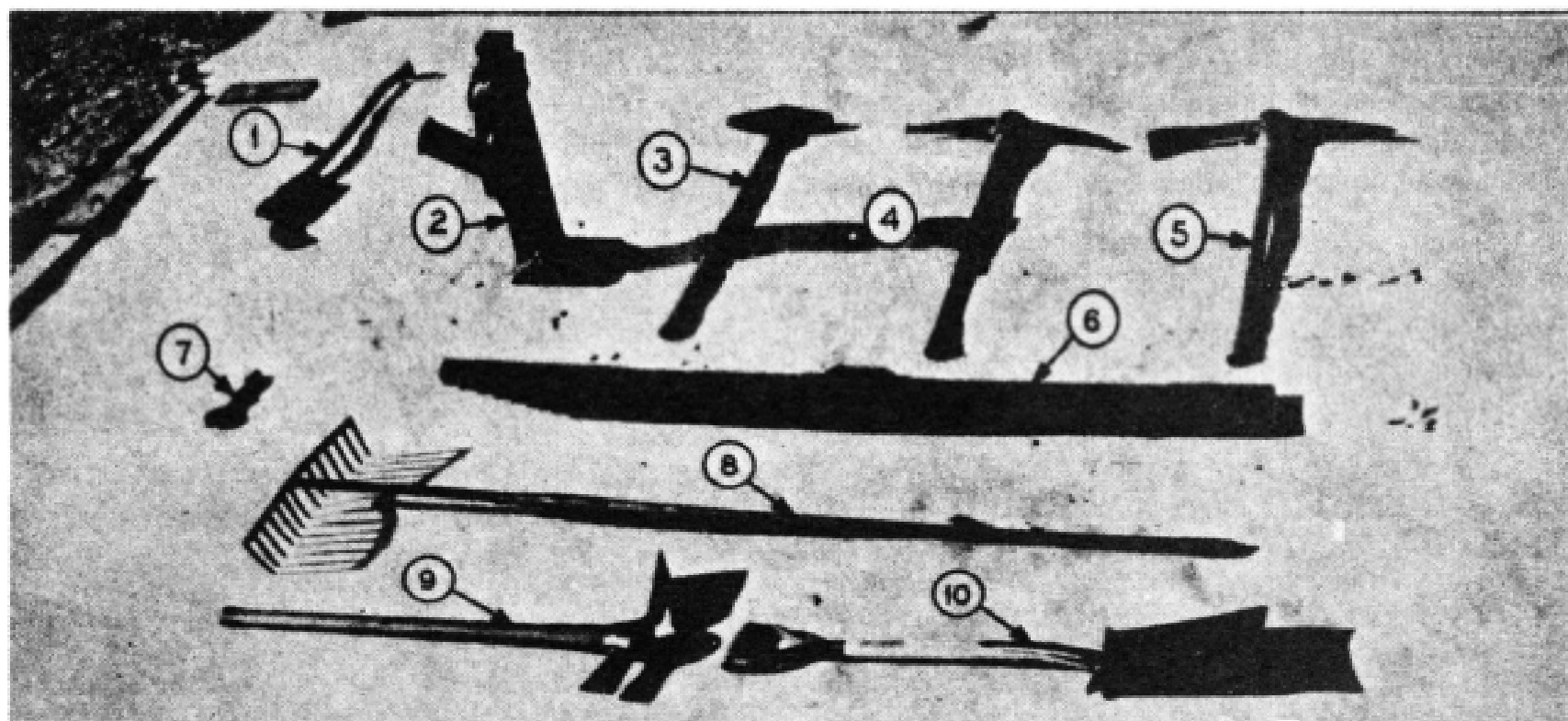
2-6.3. Special Tool and Equipment Maintenance Procedures. In areas where climatic conditions other than temperate exist, special instructions will be given and provisions made for the handling of tools and equipment. This applies to Arctic, tropic, and other severe climatic areas where intense cold, heat, or humidity affect the materials from which tools and equipment are made, as well as handling, storage, replacement, and repair. Adjustment shall be made in supplies and stocks to meet the local situation.

2-6.4. Storage. Tools shall be stored neatly in toolhouses when not in use. Small tools are best kept in toolboxes, whereas larger sharp tools, such as bars, picks, and forks, are best stored in racks designed to protect their points and at the same time be safe for personnel moving about the toolhouse. Power tools or machinery shall be housed against weather, and their accessories systematically stored for ready application.



A.

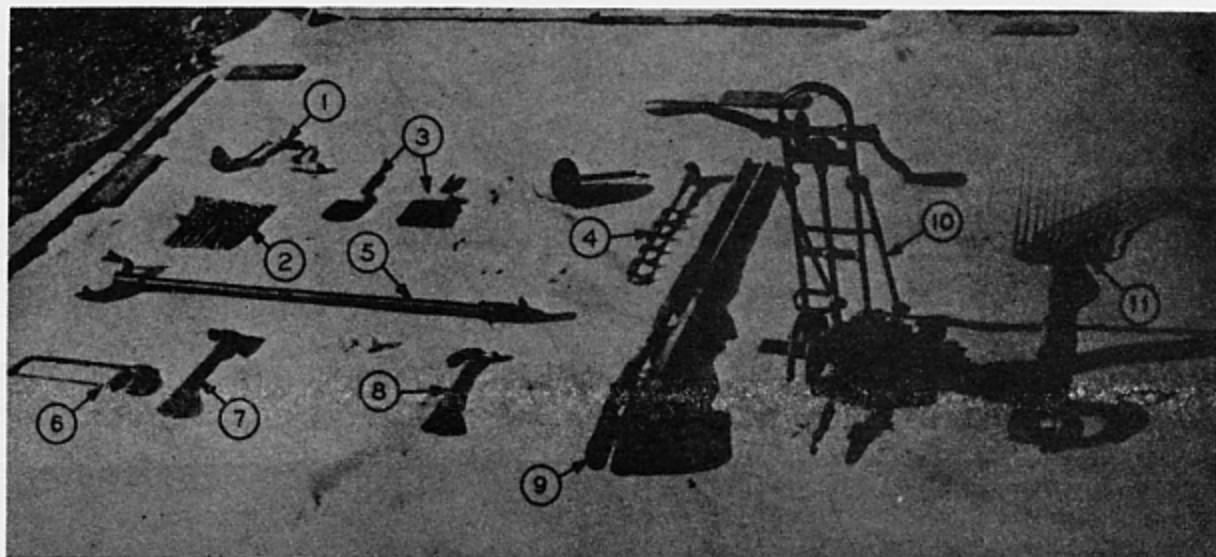
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|------------------|---------------------------------------|--------------------|
| 1. Scythe        | 5. Short-handled, square point shovel | 7. Scoop           |
| 2. Hand saw      |                                       | 8. Rail tong       |
| 3. Two-man saw   | 6. Long-handled, round point shovel   | 9. Tie tong        |
| 4. Sledge hammer |                                       | 10. Track wrenches |



B.

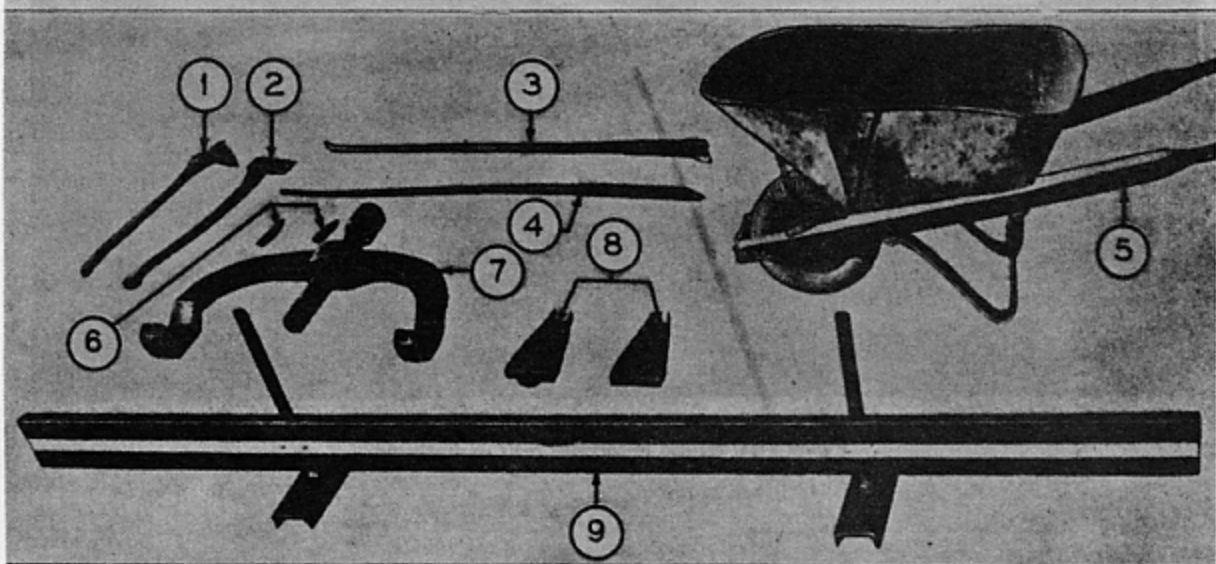
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|---------------|-------------------------|------------|
| 1. Brush hook | 4. Pick                 | 8. Rake    |
| 2. Track jack | 5. Tamping pick         | 9. Mattock |
| 3. Spike maul | 6. Level board          | 10. Spade  |
|               | 7. Spike-claw extension |            |

Figure 2-17. Track tools (Sheet 1 of 2).



C.

- |                  |                |                           |
|------------------|----------------|---------------------------|
| 1. Drill brace   | 5. Track gage  | 9. Post-hole digger       |
| 2. Wood drills   | 6. Hacksaw     | 10. Rail-drilling machine |
| 3. Paint brushes | 7. Hatchet     | 11. Ballast fork          |
| 4. Boring tool   | 8. Claw hammer |                           |



D.

- |             |                 |                    |
|-------------|-----------------|--------------------|
| 1. Tie adze | 4. Lining bar   | 7. Rail bender     |
| 2. Ax       | 5. Wheelbarrow  | 8. Sighting blocks |
| 3. Claw bar | 6. Track drills | 9. Spot board      |

Figure 2-17. (Sheet 2 of 2).

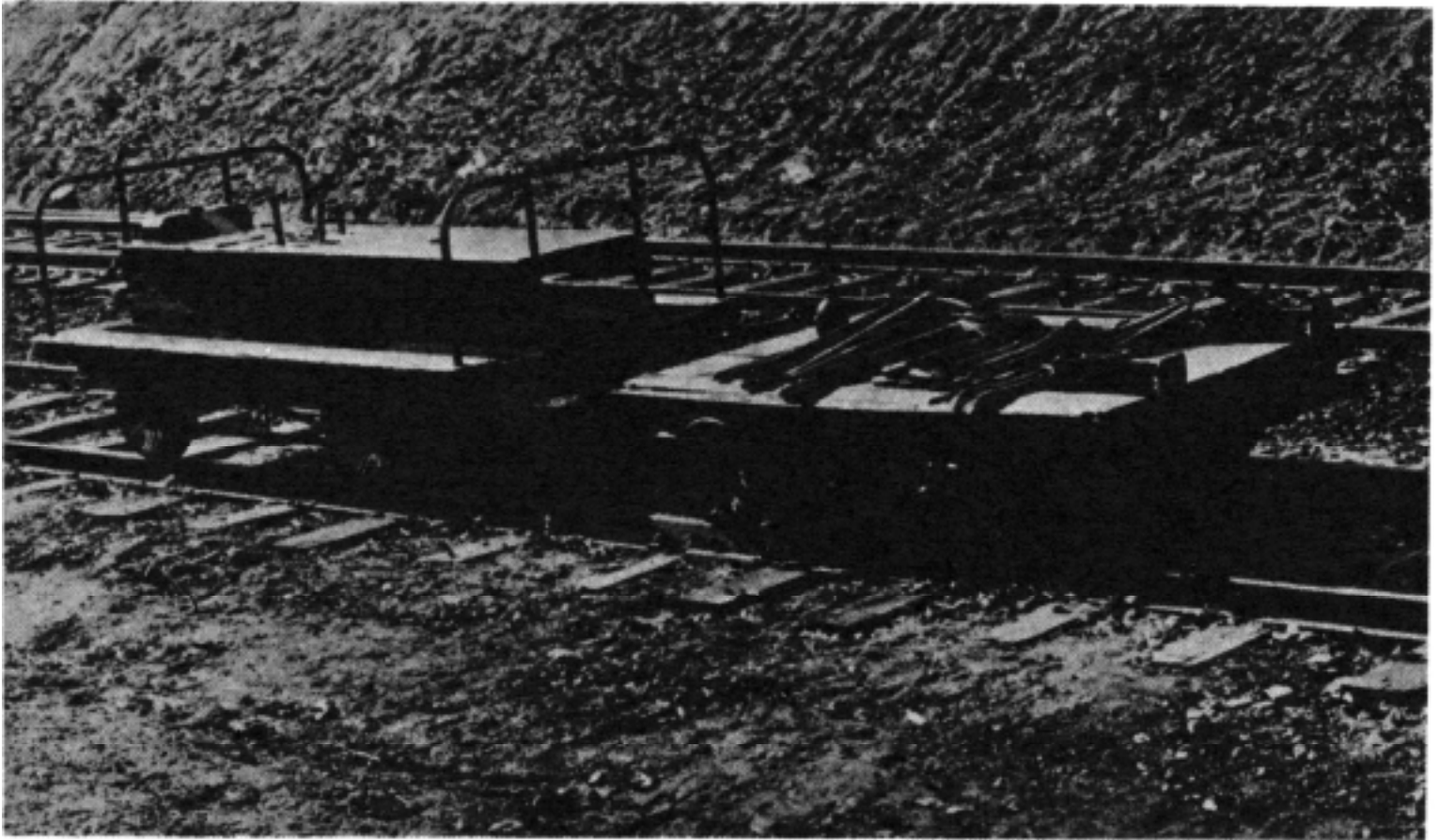


Figure 2-18. *Method of carrying tools on track car.*